CEREAL RUST BULLETIN

Report No. 1
Date: May 2, 1972

CEREAL RUST LABORATORY UNIVERSITY of MINNESOTA, ST. PAUL, 55101

PLANT PROTECTION PROGRAMS, APHIS, and PLANT SCIENCE RESEARCH DIVISION, ARS,
U.S. DEPARTMENT OF AGRICULTURE

J. B. Rowell, Leader (Res. Plant Pathologist)
W. R. Bushnell, Res. Plant Physiologist
M. G. Eversmeyer, Res. Plant Pathologist
D. V. McVey, Res. Plant Pathologist
A. P. Roelfs, Res. Plant Pathologist
P. G. Rothman, Res. Plant Pathologist

A mild winter throughout the southern U.S. was interrupted only by a single cold period in central Texas. Subsoil moisture was adequate during the winter; however, a dry spring in the Texas-Arkansas area was becoming critical to cereal crops by late April. Widespread showers on April 27 and 28 may have relieved this moisture stress. A cold spring slowed spring planting in the Dakota's and Minnesota. Currently, crops are approximately a week later than normal with little planting done in Minnesota and North Dakota, and wet fields may continue to delay planting.

Wheat is generally in the dough stages in north central Texas and southern Alabama, and from central Georgia through the Mississippi Delta area wheat varies from berry to milk stages. Wheat in Kansas varies from the late boot to heading stage with the exception of the extreme Northwest where the wheat is normally later. Oats are generally in the milk stage across the South along the Gulf Coast and north central Texas. Barley is in the mid-dough stages in this same area.

Wheat stem rust.--Stem rust overwintered in commercial fields in south Texas (south of Abilene-Waco) and in the southern portions of Louisiana, Alabama, and the panhandle of Florida. Spread has generally been within plots and fields with a few exceptions. Isolated centers resulting from exogenous inoculum were found at Denton and Honey Grove, Texas. An isolated overwintering center was found at Rohwer, Arkansas. A major source of inoculum appears to be the Baldwin County area of Alabama from which stem rust now has spread as far as Selma and Auburn in Alabama, to Tifton in Georgia and Quincy in Florida. In this area severities in commercial fields were generally light (Tr-5%); however, a single field was observed in Baldwin Co. with 100% severity and 100% loss, and another was reported in Walton Co., Florida (Barnett). Race identification on collections from these fields is now underway. Stem rust in nurseries is most severe on the varieties Blueboy, McNair 701, and McNair 2203.

The first stem rust was found on January 5 (Garcia) in a nursery at Oceanside, California. Stem rust was observed at Weslaco, Texas on March 22 (Romig) and College Station on March 23 (Gilmore). This is three weeks earlier than rust was observed in Texas in 1971. Only a few isolates have been identified in the race survey at present (Table 1).

Wheat leaf rust.--Although leaf rust is much lighter in the Mississippi River Delta area than last year, an exceptionally severe epidemic occurred in Georgia. Blueboy comprised approximately 70% of the 200,000 acres of Georgia wheat (Tipton). It is estimated that much of this will not be economically harvested for grain due to leaf rust. The cultures identified from these fields are UN 13 and UN 2. Blueboy probably has genes LR 1 and LR 10 for leaf rust resistance (Browder). Other varieties in these areas are relatively free of rust including Wakeland and Blueboy II. Leaf rust is light to moderate elsewhere. It apparently did not overwinter in Kansas but now occurs as far north as Manhattan (Browder). A few fields with severities of 10% were observed in southern Kansas

CEREAL RUST BULLETIN

Report No. 2
Date: May 23, 1972

CEREAL RUST LABORATORY UNIVERSITY of MINNESOTA, ST. PAUL, 55101

PLANT PROTECTION PROGRAMS, APHIS, and PLANT SCIENCE RESEARCH DIVISION, ARS,
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J. B. Rowell, Leader (Res. Plant Pathologist)
W. R. Bushnell, Res. Plant Physiologist
M. G. Eversmeyer, Res. Plant Pathologist
D. V. McVey, Res. Plant Pathologist
A. P. Roelfs, Res. Plant Pathologist
P. G. Rothman, Res. Plant Pathologist

Average maturity of the small grain cereal crops is near normal in the southern half of the USA. The range in maturity is greater than normal, however, resulting from an early dry period and also extended periods of below and above normal temperatures. Dry-land wheat in southwestern Oklahoma, the Texas and Oklahoma panhandles, southwestern Kansas, and southeastern Colorado was severely damaged by drought, although less so in Oklahoma and Texas than in 1971. Rains during early May were too late to help the majority of the dry-land acreage in this area, but it has caused a lot of variation in maturity. Last week test cutting had been started along the Red River of the South in Oklahoma; however, a couple of fields in Texas, nearby, were just flowering.

Northern winter wheat fields are in good condition and near normal in maturity. Spring grains are one week later than normal in South Dakota. Most of the crop in west central Minnesota was just emerging last week. Fields in the southern end of the Red River Valley of the North (Fargo to Grand Forks) still had water standing on them early last week, with no planting and little tillage done. North of Grand Forks planting was done in early May as normal. Although a wide range exists it appears now that spring cereal crops in Minnesota and North Dakota will be about two weeks later than normal.

Wheat stem rust.--Stem rust has spread considerably during the past three weeks. It moved up the east coast as far as southern North Carolina (Newton) and South Carolina (Kline); however, it was not observed in northern Alabama. A few pustules were found in southern Illinois (Smith, May 19). Stem rust is common in trace amounts in commercial wheat fields south of a line from just north of Stillwater to 40 miles north of Elk City, Oklahoma. North of this line single pustules were found at Greensburg and Pratt, Kansas last week. (See also barley stem rust.) On Friday an old center was found near Manhattan, Kansas in a plot of Blueboy and a few scattered pustules on the varieties of Pronto and Caprock. This is a week or more earlier than in recent years. Moderate amounts of stem rust were reported on Neepawa and Manitou, and trace amounts on Waldron in an uninoculated disease nursery near Skidmore, Texas (Garcia). Thus, a late season and higher than normal recent temperatures make the prospects of stem rust development greater than any year since 1965. There has been no substantial change in the race picture since the last report (Table 1).

Wheat leaf rust.--Leaf rust is widespread as far north as Nebraska. Central Kansas severities range from a trace to 30%. In central Oklahoma, severities of up to 30 to 80% were common with the wheat in the soft dough stage. Losses due to leaf rust in Texas, Oklahoma, and southern Kansas will be light, but moderate losses may occur in the case of some more susceptible varieties. No leaf rust has been reported in Nebraska. However, with rains reported somewhere in that state each day in early May, it probably will become widespread within the week. Leaf rust was found in a Cheyenne wheat plot at St. Paul, Minnesota on May 11, where it previously was observed March 20. Prevalence increased from 1 pustule/5 foot of row on May 11 to 1 pustule/foot of row by May 17. Leaf rust was found in southern Illinois last week (Smith).

Oat stem rust.--Stem rust continues to be scarce. It has been found as far north as Denton (Gardenhire) and Iowa Park, Texas. Races identified are predominantly race 31 (6AF) from Ciudad Obregon, Mexico (92% of the 26 isolates). Race 61 (7F) was also isolated (8% of the isolates). The collections from Beeville, Texas were race 31 (68% of the 25 isolates), 61 (6%), and 76 (1H, 8%). Race 31 is virulent on all commercial oat varieties.

Oat crown rust.--Crown rust remains light. A single small pustule was found on Poa pratensis at St. Paul, Minnesota last week. A few aecia are present in the buckthorn nursery at St. Paul (Moore). Crown rust could be as serious in 1972 as in 1970, due to the acreage of late planted oats in Minnesota and the eastern Dakota's.

Barley stem rust.--Stem rust was reported in two fields of winter barley in south central Kansas last week. A 1% severity and 70% prevalence was observed near Winfield, Kansas. This field had been used for grazing and was in the berry stage. This severity was greater than that observed on wheat in Oklahoma and northern Texas. No sporulating rust was found in commercial fields or test plots of wheat in this area. A further survey of barley fields in southern Kansas is underway. Losses in this area will be light with most of the barley at the dough stages.

Barley leaf rust.--In the limited barley acreage in southern Kansas and Oklahoma, this rust reached 50% severity as the leaves matured. This is much more severe than normal for this area. Losses will range from light to moderate.

Rye rusts.--Rye leaf rust overwintered in plots as far north as St. Paul, Minnesota, and the severity is now approximately 1 pustule/culm. The only field checked in central Oklahoma had 50% severity at the milk stage. Fields in west central Oklahoma were free of rust. No stem rust of rye has yet been reported in the USA.

Triticale rusts.--Reports of trace amounts of stem rust were received from nurseries in northern Texas and southern Oklahoma. A field being grazed north of Stillwater, Oklahoma had 2% leaf rust severity last week. A trace of leaf rust was found in a triticale field in southern Illinois (Ceglinski, May 5).

Barberry Rust.--Rust on barberry was observed in several locations in Virginia during May (Saunders, Callahan, Jones, Bostic), and in west central Pennsylvania (Lilley). Determination of Puccinia graminis f. sp. is now underway.

TABLE 1. PRELIMINARY RESULTS OF THE 1972 RACE SURVEY (MAY 22).

No. of collections	Area	Standard race	No. of isolates	% of isolates virulent on: SR genes							
				5	9d	d1v	7b	11	6	8	9a
1	Oceanside, Cal.	15	6	100	100	100	100	100	100	100	0
88	Obregon, Mex.	151	71	100	100	0	0	87	92	100	46
	"	11-32	218	100	100	0	100	64	100	99	99
45	Texas	151	82	100	100	0	0	65	82	95	71
	"	11-32	34	100	100	0	100	41	100	85	100
	"	15	23	100	100	100	100	100	0	83	13
12	Louisiana	151	3	100	100	0	0	0	0	100	100
	"	11-32	10	100	100	0	100	70	100	100	100
	"	15	26	100	100	100	100	100	0	100	0
3	Florida	151	4	100	100	0	0	0	100	100	100
	"	11-32	5	100	100	0	100	100	100	100	100
149	Total		482	100	100	6	65	74	82	96	74

CEREAL RUST BULLETIN

Report No. 3
Date: June 13, 1972

CEREAL RUST LABORATORY — UNIVERSITY of MINNESOTA, ST. PAUL, 55101

PLANT PROTECTION PROGRAMS, APHIS, and PLANT SCIENCE RESEARCH DIVISION, ARS,
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J. B. Rowell, Leader (Res. Plant Pathologist)
W. R. Bushnell, Res. Plant Physiologist
M. G. Eversmeyer, Res. Plant Pathologist
D. V. McVey, Res. Plant Pathologist
A. P. Roelfs, Res. Plant Pathologist
P. G. Rothman, Res. Plant Pathologist

Near normal maturity is the rule for the small grain cereals growing in the hard red winter wheat area. In the northern soft red winter wheat area, crop maturity is about one week early. Spring sown crops are from 1 to 3 weeks late. Harvest is underway in Oklahoma and Texas and will start this week in southern Kansas.

Wheat stem rust.--Stem rust has spread along the Mississippi River as far north as Bloomington, Ill., where it is reported severe on a few susceptible experimentals (Miskin). Reports indicate stem rust is present across central Missouri, western Kentucky, and southwestern Ohio. Stem rust is widespread in Kansas with severities light; however, occasional hot spots with severities from 5-10% were reported. Collections with a trace to 1% severity were received from northwestern Kansas; the wheat maturity varied from milk to soft dough. Although no further reports have been received from Nebraska, the rust increase in northern Kansas would indicate it probably is present at least in trace amounts across the southern part of the state. A couple of rusted fields were found in West Virginia (Bostic) much earlier than normal, with crops in the early dough stage. Whether this rust is due to inoculum from the Gulf Coast or from barberries is uncertain. The race identification of the collections made in Mexico, Texas, Louisiana, Alabama, Florida, and Georgia are from 90 to 100% complete with the data shown in Table 1. Noteworthy is the lack of race 15 from Mexico; the abundance of race 151 from Alabama, Florida, and Georgia; and the abundance of race 15 (collections from 5 different locations) in Louisiana. The vast size of the state of Texas obscures the pattern of race distribution therein. Inspection of the Texas data indicates that race 15 probably occurred only in the northern half of the state and race 11-32 was predominant in the south. Complete analysis of the data is underway. The collections from Skidmore, Tex. on Waldron and Neepawa were of race groups 11-32 and 151. Waldron was moderately resistant as a seedling to these cultures; however, Wisc. 271 was susceptible in the initial tests.

Wheat leaf rust.--Leaf rust has been found on winter wheat plots in trace amounts as far north as Casselton and Fargo, N. D. (Statler, Miller). Leaf rust is also present in a plot of Thatcher spring wheat at Minot, N. D. (Timian and Hoag). Leaf rust on winter wheat in South Dakota is heavy and losses will be moderate (Buchenau). Leaf rust is light but is rapidly increasing in Nebraska; the losses generally will be light. Leaf rust in the northern soft red winter wheat area is light with the crop in the dough stage. Traces of leaf rust were reported on the white winter wheats in Washington. At St. Paul severity in Cheyenne winter wheat now is 1-5% at heading.

Wheat stripe rust.--Stripe rust has been found in experimental plots in southeastern Washington.

Oat stem rust.--Oat stem rust was found at Ames, Iowa last week (Simons) and in western Kentucky (Flake). The few reports from Kansas, Oklahoma, and southern Nebraska probably are attributable to three factors: 1) trace amounts of rust, 2) limited acreage of oats (180,000), and 3) minimal examinations of oat fields for rust. The preliminary data from the survey are shown in Table 2.

Oat crown rust.--Crown rust is present in commercial fields as far north as central Illinois. A few scattered pustules with secondary rings and secondary infections were observed at St. Paul, Minn., several hundred yards from the buckthorn nursery. Infection in the buckthorn nursery and on other buckthorns in central Minnesota is moderate to heavy. Buckthorns also are infected in Illinois and Iowa, and in the latter case nearby oats are rusted.

Barley stem rust.--Barley stem rust has been reported in northern Oklahoma (Goodfellow) and in western Kentucky (Allen).

Barley leaf rust.--Trace amounts of leaf rust were found in plots in the Lansing, Mich. area. The Kansas barley is maturing, and no leaf rust has been reported on the small acreage (50,000) grown in Nebraska.

Rye stem rust.--Stem rust in trace amounts was found in a nursery at Tifton, Ga. (Morey) and in a field in western Kentucky (Allen). It also has been reported in southwestern Ohio (Flake). The collections from rye growing in the nurseries at Ciudad Obregon, Mexico, were all of Puccinia graminis f. sp. tritici.

Rye leaf rust.--Leaf rust has increased in plots at St. Paul, Minn. to nearly 5% severity at flowering. Commercial fields in West Virginia were reported to have 5-10% severity with 15% prevalence (Bostic). Rust is found in most of lower Michigan with severities moderate in the southwestern part of the state.

Triticale rusts.--No further reports have been made. An earlier leaf collection from Illinois (May 5, Ceglinski) contained a trace amount of stem rust.

Barberry rusts.--Additional specimens have been received from West Virginia, Pennsylvania, and Virginia. New reports were from Iowa, Minnesota, and Wisconsin.

Table 1. Preliminary results of the 1972 wheat stem rust survey (June 11).

No. of collections	Area	Standard race	No. of isol.	% of isolates virulent on: SR genes 5	9d	d1v	7b	11	6	8	9a
19	Alabama	11-32	12	100	100	0	100	33	100	83	100
		151	43	100	100	0	0	0	100	98	100
2	Arkansas	11-32	3	100	100	0	100	66	100	100	100
		15	3	100	100	100	100	100	0	100	0
1	California	15	6	100	100	100	100	100	0	100	0
11	Florida	11-32	9	100	100	0	100	66	100	100	100
		151	20	100	100	0	0	0	100	100	100
		15	1	100	100	100	100	100	0	100	0
		56	2	100	0	0	100	0	0	0	0
5	Georgia	11-32	4	100	100	0	100	0	100	100	100
		151	8	100	100	0	0	0	100	100	100
		15	2	100	100	100	100	100	0	100	0
22	Louisiana	11-32	16	100	100	0	100	88	100	100	88
		151	6	100	100	0	0	0	50	75	100
		15	47	100	100	100	100	100	0	98	0
60	Texas	11-32	51	100	100	0	100	61	100	84	100
		151	93	100	100	0	0	66	84	96	71
		15	41	100	100	100	100	100	0	89	0
		17-29	1	0	100	0	100	0	0	100	0
100	Mexico	11-32	225	100	100	0	100	67	100	99	99
		151	70	100	100	0	0	86	90	100	44

Table 2. Preliminary results of the 1972 oat stem rust survey (June 11).

No. of collections	Area	No. of isolates	No. of isolates of each race: 2	21 (7A)	31 (6AF)	32 (7AF)	61 (7F)	76 (1H)
2	Arkansas	6				6		
4	Louisiana	12	6		5	1		
2	Mississippi	6				6		
13	Texas	34			26		6	2
12	Mexico	32		2	26	4		

CEREAL RUST BULLETIN

Report No. 4
Date: June 27, 1972

CEREAL RUST LABORATORY — UNIVERSITY of MINNESOTA, ST. PAUL, 55101

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W. R. Bushnell, Res. Plant Physiologist
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A. P. Roelfs, Res. Plant Pathologist
P. G. Rothman, Res. Plant Pathologist

Winter wheat maturity ranges from hard dough in most of northern Kansas, to milk in the Nebraska panhandle, and to full berry in central South Dakota. Spring planted cereals in South Dakota and Minnesota are heading in general, but occasional fields are just emerging.

Wheat stem rust.--Stem rust reached severities of up to 30% in commercial fields of Parker in north-central Kansas. In this same area fields of Bison and Satanta had severities of 10%. Scout and the other more recent Nebraska varieties had only trace amounts of rust. Damage in Kansas will be limited to the north-central area. In Nebraska the common commercial varieties are resistant. Stem rust was found in trace amounts across the eastern 2/3 of Nebraska and in south-central and central South Dakota. The majority of the early stem rust collections from Oklahoma are race 15B-2 so further damage is not expected on commercial wheat, although more rust will be present on wild grasses and experimental plots than usual. Adequate time remains for a buildup on late planted spring wheat if a culture with adequate virulence becomes established. Heavy rust, 40% severity at milk stage, was reported near barberry in West Virginia (Bostic).

Wheat leaf rust.--Leaf rust has caused light to moderate losses in the eastern 2/3 of Nebraska and should reach flag leaf severities from 80-100% at maturity. Leaf rust occurs throughout the hard red spring wheat area, with severities of a trace to 5%. Some rust was found in nearly every spring wheat field visited in eastern South Dakota and southern Minnesota.

Oat stem rust.--Stem rust continues to be light with collections from Kansas, Missouri, and a nursery in Butte County, Calif. (Prato) received during the past two weeks. Isolates from north Texas collections were of many races, most of which have not been common recently.

Oat crown rust.--Crown rust could become severe in western Minnesota and the Dakotas, especially in late planted fields. Last week severities of 1% were common, with most fields just starting to head. Elsewhere, losses will be light except where buckthorns and/or late planting caused a favorable environment for the disease.

Barley rusts.--Stem rust is present on commercial varieties in plots in the eastern 2/3 of Nebraska. No commercial fields were observed in this area. By maturity, stem rust will probably occur only in trace amounts on spring barleys, causing little loss. Leaf rust occurs as far north as central South Dakota. Most fields have approximately 1% severity and 100% prevalence. This amount of rust will cause some loss. Less than usual amounts of Helminthosporium blotch were found, so leaf rust could be an important disease of the spring barleys this year.

Rye rusts.--The only additional reports of stem rust are in nurseries where the pathogen is probably Puccinia graminis f. sp. tritici. Leaf rust varies from moderate to heavy in commercial fields in Nebraska, South Dakota, and Minnesota. Flag leaf severities at early dough ranged from 20-60% with 80-100% prevalence, and losses will be light.

Triticale rusts.--Most spring triticales continue to be moderately resistant to leaf rust and resistant to stem rust. In general, the winter types are more susceptible to both diseases.

Barberry rust.--Additional collections have been received from West Virginia, Pennsylvania, and Minnesota. New reports were from Illinois (Halstead) and Washington (Dalrymple).

CEREAL RUST BULLETIN

Report No. 5
Date July 11, 1972

CEREAL RUST LABORATORY
UNIVERSITY of MINNESOTA, ST. PAUL, 55101

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D. V. McVey, Res. Plant Pathologist
A. P. Roelfs, Res. Plant Pathologist
P. G. Rothman, Res. Plant Pathologist

Winter wheat is near maturity, except in Minnesota and North Dakota where it is in soft dough and in South Dakota where it is in mid dough. Spring wheat varies from heading to berry stage with isolated fields in the jointing stage. Oats are extremely variable ranging from mature in eastern Nebraska to jointing in isolated fields of western Minnesota and the eastern Dakotas. Barley ranges from heading to early dough in the north-central states.

Wheat stem rust.--Stem rust is widespread in trace amounts in commercial fields in Nebraska and South Dakota (Palmer, Baker, Smith). No reports concerning North Dakota are available. Trace amounts of stem rust have also been found in winter wheat fields in several southern Minnesota counties (Laudon, Ludwitzke, Krentz). In plots at North Platte, Nebr., the susceptible variety RedChief had 10% severity at soft dough (Schmidt). At Ames, Ia. a Wichita backcross line had 20% severity (Simons) and at Presho, S. D., Omaha had 2% severity (Buchenau) last week. Trace amounts of stem rust were found in Michigan at maturity (Zumbrock, Clayton, Greene, Loree). In Indiana and Illinois stem rust has been found in nurseries and on wild barley (Caldwell, Komanetsky). In Pennsylvania a trace amount of stem rust was found (Nelson). In Virginia and West Virginia severe stem rust with 10-60% severity was reported, frequently on the variety Blueboy (Callahan, Roane, Saunders, Bostic). Preliminary results from the central area of the USA are shown in Table 1.

Wheat leaf rust.--Leaf rust has increased rapidly in the past two weeks. The spring wheat varieties Chris, Fortuna, Sheridan, Polk, and Fletcher are more severely rusted than normal. The question remains as to the amount of protection the Frontana adult plant resistance will provide. Neepawa and Manitou will generally suffer losses. Leaf rust continues to move northward through the eastern soft wheat area, where losses will be moderate.

Oat stem rust.--Oat stem rust remains light and scattered in contrast to wheat stem rust. The only difference observed in oat stem rust this year has been a shift away from race 31 (Table 2). Trace amounts of stem rust are now present in southern Minnesota (Smith), in eastern Nebraska (Palmer), and in central Illinois plots (Jedlinski).

Oat crown rust.--Crown rust is rapidly increasing in at least the South Dakota and western Minnesota area and will cause light losses on early planted oats to heavy losses in late oats.

Barley rusts.--Stem rust occurs in light amounts on barley in Minnesota and South Dakota (Smith). Due to late planting, the stem rust is one to two weeks ahead of normal on barley. Leaf rust is present in light amounts in the commercial barley fields and is increasing rapidly.

Rye rusts.--Stem rust in trace amounts is reported in fields in Nebraska, Minnesota, Wisconsin, and South Dakota (Palmer, Schulz, Schlick, Line, Smith) and in moderate amounts in West Virginia (Bostic). Leaf rust is severe throughout the north-central states and moderate to severe in Illinois (Myers) and Pennsylvania (Kadow). Losses will be light from leaf rust and nil from stem rust.

Triticale rusts.--A single report was received of stem rust in a commercial field in Lancaster County, Nebr. with a severity of tr-10% and trace prevalence (Palmer). Leaf rust severity was 10% in this field.

Barberry rust.--Additional collections were received from Pennsylvania (Keim, Albright) and Wisconsin (Line, Schwarze). Most of the aeciospores examined have been avirulent on Little Club wheat, Hypana barley, Prolific rye, Marvellous oats, and Einkorn monococcum. Several samples have been noted that yielded no or little sporulation on Hypana and Einkorn but definite hypersensitive flects. Of the 4 isolates identified as wheat stem rust, 3 isolates were race 151 and the other was virulent only on Sr 5.

Table 1. Partial preliminary results of the 1972 wheat stem rust survey (July 11).

No. of collections	State	Standard race	No. of isolates	% of isolates virulent on: SR genes 5	9d	d1v	7b	11	6	8	9a
2	Illinois	11-32	2	100	100	0	100	0	100	100	100
		15	3	100	100	100	100	100	0	0	0
44	Kansas	11-32	10	100	100	0	100	20	100	90	90
		15	82	100	100	100	100	100	0	78	1
		151	12	100	100	0	0	8	17	100	100
5	Kentucky	15	3	100	100	100	100	100	0	100	0
		151	10	100	100	0	0	0	0	40	100
2	Nebraska	11-32	1	100	100	0	100	100	100	100	100
		151	1	100	100	0	0	0	0	100	100
4	N. Carolina	11-32	2	100	100	0	100	0	100	100	100
		151	10	100	100	0	0	0	30	100	100
22	Oklahoma	15	25	100	100	100	100	100	0	96	0
2	S. Carolina	15	6	100	100	100	100	100	0	100	0
3	W. Virginia	11-32	1	100	100	0	100	0	100	100	100
		151	4	100	100	0	0	0	0	100	100

Table 2. Partial preliminary results of the 1972 oat stem rust survey (July 11).

No. of collections	State	No. of isolates	No. of isolates of each race: 1 (1)	2 (2)	7 (7)	8 (8)	31 (6AF)	32 (7AF)	61 (7F)	76 (1H)	77 (2H)	78 (5H)	88 (7AH)
3	Arkansas	9						6	3				
1	California	3				3							
1	Iowa	3						2	1				
4	Louisiana	12		6			5	1					
2	Mississippi	6						6					
1	Oklahoma	2		1					1				
42	Texas	117	6		1	1	30	2	52	3	11	10	1

CEREAL RUST BULLETIN

Report No. 6
Date: July 25, 1972

CEREAL RUST LABORATORY
UNIVERSITY of MINNESOTA, ST. PAUL, 55101
PLANT PROTECTION PROGRAMS, APHIS, and PLANT SCIENCE RESEARCH DIVISION, ARS,
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J. B. Rowell, Leader (Res. Plant Pathologist)
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D. V. McVey, Res. Plant Pathologist
A. P. Roelfs, Res. Plant Pathologist
P. G. Rothman, Res. Plant Pathologist

Winter wheat and rye are in the mid-to-hard dough stage throughout most of the northern USA. Maturity of spring sown cereals averages 2 weeks later than normal, but early planted oats in southern Minnesota are being swathed. High temperatures and showers last week provided ideal conditions for rust increase on late planted cereals.

Wheat stem rust.--Stem rust has been found as far north as Fargo, N. D. (first reported June 8, Miller) and Crookston, Minn. Susceptible varieties had severities as follow: 10% on Marquis at Crookston, Minn.; 65% on Nebred at Brookings, S. D. (Buchenau); 30% on Racine at Madison, Wisc. (Line); and 20% on Blueboy at Manchester, Mich. (Clayton). Commercial winter wheat fields in general had a trace to 5% severity throughout Nebraska, South Dakota, Minnesota, Wisconsin, and Michigan. Several fields with 10 to 15% severity were observed in the Nebraska panhandle (Baker) and a single field in Wisconsin (Line). In Virginia and West Virginia, where only a limited acreage of wheat is grown, terminal severities of 50 to 60% were common. Although a few pustules have been found on varieties classified as resistant, no buildup of virulent rust on these varieties has been reported. The severe natural development of stem rust on susceptible varieties in scattered locations over a wide area indicates that conditions in 1972 favored the development of a severe epidemic of wheat stem rust. This disaster was prevented by the effective control measures of barberry eradication and the widespread planting of resistant varieties. A partial preliminary report of the wheat stem rust race survey is shown in Table 1.

Wheat leaf rust.--Leaf rust on the commercial spring wheat crop remains light. In southern and central Minnesota flag leaf severities of 5 to 15% were common on the varieties Chris, Fletcher, and Polk; trace to 5% on Era, World Seeds 1809, and Bounty 208; 40 to 80% on Selkirk, Manitou, Neepawa, and Inia 66; while Waldron and the durums, Leeds and Wells, were highly resistant.

Oat stem rust.--Stem rust became widespread in northeast Nebraska at the early dough stage (Baker), with a few east-central Nebraska fields having terminal severities of 5%. Stem rust is in scattered fields across southern Minnesota and Iowa, and in plots in central Wisconsin (Line). Most of the commercial varieties grown in the north-central states are resistant to race 32, an important component of the early collections (Table 2).

Oat crown rust.--Crown rust is present northward to the Canadian border. Reports indicate that eastern South Dakota and west-central Minnesota are the most seriously affected.

Barley stem and leaf rusts.--Stem rust on commercial barley reached 10% severity and 20% prevalence in an east-central Nebraska field at maturity (Palmer). Stem rust was found in a field in north-central North Dakota (Smith); elsewhere, stem rust has remained light except in a few plots. Leaf rust is present throughout the upper Great Plains in light to moderate amounts.

Rye stem and leaf rusts.--Trace amounts of stem rust were reported in a plot of 'Coloma' rye at Arlington, Wisc. (Line). Leaf rust is heavy on rye in south and central Minnesota and light in northern Minnesota.

Triticale rusts.--Stem rust was reported in plots in Deaf Smith and Randall Counties of the Texas panhandle (Jenkins), and in a field in Douglas County, Ill. (Komanetsky). Leaf rust is generally light.

Barberry rust.--Rust was reported on barberry in Pennsylvania (Martin, Gates) and Wisconsin (Bennett).

Table 1. Partial preliminary results of the 1972 wheat stem rust survey (July 23).

No. of collections	State	Standard race	No. of isolates	% of isolates virulent on: SR genes 5	9d	d1v	7b	11	6	8	9a
15	Illinois	11-32	11	100	100	0	100	0	100	100	100
		15	3	100	100	100	100	100	0	0	0
		151	19	100	100	0	0	16	16	100	100
1	Indiana	151	3	100	100	0	0	0	100	100	100
1	Iowa	15	1	100	100	100	100	100	0	0	100
60	Kansas	11-32	20	100	100	0	100	10	95	100	100
		15	127	100	100	100	100	100	0	79	1
		151	24	100	100	0	0	4	8	100	100
6	Kentucky	15	3	100	100	100	100	100	0	100	0
		151	10	100	100	0	0	0	0	40	100
1	Minnesota	15	1	100	100	100	100	100	0	0	0
2	Missouri	151	6	100	100	0	0	0	0	100	100
5	Nebraska	11-32	1	100	100	0	100	100	0	100	0
		15	3	100	100	100	100	100	0	100	0
		151	7	100	100	0	0	0	0	100	100
25	Oklahoma	11-32	7	100	100	0	100	75	100	100	100
		15	25	100	100	100	100	100	0	96	0
		151	21	100	100	0	0	0	0	100	100
3	S. Carolina	15	6	100	100	100	100	100	0	100	0
		151	3	100	100	0	0	0	0	100	100
7	W. Virginia	11-32	1	100	100	0	100	0	100	100	100
		151	16	100	100	0	0	0	0	100	100

Table 2. Partial preliminary results of the 1972 oat stem rust survey (July 23).

No. of collections	State	No. of isolates	No. of isolates of each race: 2 (2)	8 (8)	31 (6AF)	32 (7AF)	61 (7F)	Others
3	Arkansas	9				6	3	
4	California	12	3	9				
1	Iowa	3				2	1	
4	Louisiana	12	6		5	1		
2	Mississippi	6				6		
1	Missouri	3				3		
1	Oklahoma	2	1				1	
44	Texas	117		1	30	2	52	32

CEREAL RUST BULLETIN

Report No. 7
Date: August 8, 1972

CEREAL RUST LABORATORY — UNIVERSITY of MINNESOTA, ST. PAUL, 55101

PLANT PROTECTION PROGRAMS, APHIS, and PLANT SCIENCE RESEARCH DIVISION, ARS,
U. S. DEPARTMENT OF AGRICULTURE

J. B. Rowell, Leader (Res. Plant Pathologist)
W. R. Bushnell, Res. Plant Physiologist
M. G. Eversmeyer, Res. Plant Pathologist
D. V. McVey, Res. Plant Pathologist
A. P. Roelfs, Res. Plant Pathologist
P. G. Rothman, Res. Plant Pathologist

The dedication ceremony for the newly constructed Cereal Rust Laboratory will be held on September 20, 1972. We invite you to attend this ceremony and the open house for our new office and laboratory building.

Small grain cereals were maturing rapidly until scattered showers and cool temperatures arrived in late July. Some swathing has occurred as far north as the Canadian border. The latest crops in the Red River Valley are near Fargo, N. D. Late crops also occur in north-central and northwestern North Dakota, and northeastern Montana. Some rust buildup will still occur in these fields.

Wheat stem rust.--Stem rust is now present in trace amounts in commercial wheat fields in North Dakota, Minnesota, and eastern Montana. Trace severity and prevalence is general except for 10% prevalence in winter wheat in east-central Montana (Sharp). Scattered pustules have been found in commercial fields of Chris, Lark, Manitou, Waldron, and World Seeds 1809. Additionally, moderately to severely rusted "off-type" plants have occasionally been found in fields of these varieties. In the Uniform Rust Nursery at Crookston, Minn., trace amounts of rust were observed on the old durums, Ramsey and Golden Ball. Cultures from these collections have not been identified yet. Stem rust has been observed in commercial fields of Gaines and Luke wheat in Whitman County, Wash. Severities at the dough stage ranged from 1 to 5% with 1 to 100% prevalence. At least some of this rust is due to the direct spread from barberry (Delegans).

Hordeum jubatum is rusted throughout Minnesota, North Dakota, northern South Dakota, and eastern Montana. Severities and prevalence vary, with the most rust along the Minnesota-South Dakota border.

Table 1 gives the partial preliminary results from the 1972 wheat stem rust survey. Data from inoculated plots have been omitted as far as possible.

Wheat leaf rust.--Leaf rust was present as far west as east-central Montana. Variations in weather patterns caused a wide range in severities. The most severe rust, 80% severity at mid-dough, was observed in an eastern Montana field of Thatcher. In the later maturing fields in northwestern and north-central North Dakota, leaf rust was present in approximately 50% of the fields with a trace to 5% severity at the milk stage. Commercial durums were generally free of rust. In the Uniform Rust Nurseries at Crookston and Morris, Minn., several breeding lines of durums were rusted. Some leaf rust was observed in Washington.

Oat stem rust.--Trace amounts of stem rust were observed in commercial fields of Minnesota, Wisconsin, and the eastern Dakotas. However, stem rust is present in moderate amounts on Avena fatua in this area and in trace amounts westward into Montana. Stem rust is present throughout Nebraska, including the panhandle where severities from 5 to 10% were reported (Baker, Hohnholt), and a single late field in Pierce County was found with 15% severity at flowering (Mid-July, Hohnholt). Rusted oats with 5 to 10% severity and 50% prevalence were observed near barberry in West Virginia (Bostic). Rust was also reported in other West Virginia fields in lighter amounts. (Fulk).

Oat crown rust.--Crown rust is widespread but generally light, with oat maturity ranging from late milk to ripe. However, in the area of Big Stone, Kandiyohi, Pope, Stevens, and Swift Counties in Minnesota; Codington and Grant Counties in South Dakota; and possibly southward, crown rust was severe. Many fields appear rusted from the road, and some appear dark due to crown rust telia on the sheaths. Most groats examined in this area were very light. Some fields still in the milk stage had been defoliated. Crown rust is moderately severe on Avena fatua throughout the Dakotas and Minnesota, where wild oats are much more abundant this year than normal.

Barley stem rust.--Stem rust is present in trace amounts in late barley fields and in late maturing areas of early fields in northwestern Minnesota. The barley breeding nursery at Fargo, N. D. has pustules on the primary tillers of lines known to have the "T" gene resistance (Miller). Stem rust severity of 10% was reported in two fields at the dough stage in the Nebraska panhandle (Hohnholt). This rust on barley may be due to the environment, inoculum load, additional virulence, or a combination of these factors. The identification of the virulence of these cultures is underway. Rust was also noted in Washington on a 2-row barley field associated with the previously mentioned stem rust spread from barberry to wheat.

Barley leaf rust.--Leaf rust was present throughout most of the spring barley acreage in the northern Great Plains. In the area of west-central Minnesota and east-central South Dakota where crown rust was severe, leaf rust has defoliated all but the earliest planted fields. Observations of 6-row commercial barley plots indicate that Cree is generally one of the most rusted and Larker one of the least.

Rye stem rust.--Rust continues to be found on rye grown in or near severely rusted wheat. The only cultures of P. graminis f. sp. secalis obtained so far in the survey are those from barberry aecial collections. Many of these cultures are highly avirulent on Prolific rye. Normally, some of the cultures from H. jubatum are solely or in part rye rust. During the past two weeks several stem rust centers have been found in Agropyron repens (quackgrass) in western Minnesota. In the past most cultures obtained from quackgrass have been rye stem rust. Little stem rust had been observed previously on quackgrass while surveying cereals in late July.

Rye leaf rust.--Most rye is mature; however, the few leaves remaining are heavily rusted. Leaf rust has not spread to the sheath area as it does during severe epidemics.

Triticale rusts.--Only one commercial field of triticale was observed, west-central Minnesota, and a couple of stem rust pustules were found. In the County Agent's plots and the University's demonstration plots the triticales were highly resistant to stem rust and moderately resistant to leaf rust.

Barberry rust.--Two collections from Berberis vulgaris collected in Whitman County, Wash. in late June have been partly processed. One isolate was race 56 and the other two are unknown cultures. An additional collection from this area was submitted in early August (Delegans).

Table 1. Partial preliminary results of the 1972 wheat stem rust survey (Aug. 8,'72

No. of collections	State	Standard race	No. of isolates	% of isolates virulent on: SR genes 5	9d	d1v	7b	11	6	8	9a
20	Alabama	11-32	12	100	100	0	100	33	100	91	100
		151	46	100	100	0	0	0	93	97	100
3	Arkansas	11-32	6	100	100	0	100	33	100	100	100
		15	3	100	100	100	100	100	0	100	0
1	California	15	6	100	100	100	100	100	0	100	0
12	Florida	11-32	9	100	100	0	100	66	100	100	100
		15	1	100	100	100	100	100	0	100	0
		56	2	100	0	0	100	0	0	0	0
		151	20	100	100	0	0	0	100	100	100
13	Georgia	11-32	4	100	100	0	100	100	100	100	100
		15	9	100	100	100	100	100	0	100	0
		151	14	100	100	0	0	0	57	100	100
17	Illinois	11-32	12	100	100	0	100	8	100	92	100
		15	6	100	100	100	100	100	0	50	0
		151	20	100	100	0	0	15	15	100	100
2	Indiana	151	6	100	100	0	0	50	100	100	100
5	Iowa	15	7	100	100	100	100	100	0	86	0
		151	3	100	100	0	0	33	100	100	100
86	Kansas	11-32	20	100	100	0	100	10	95	100	100
		15	187	100	100	100	100	99	0	82	0
		151	38	100	100	0	0	10	13	100	100
6	Kentucky	15	3	100	100	100	100	100	0	100	0
		151	10	100	100	0	0	0	0	40	100
22	Louisiana	11-32	16	100	100	0	100	88	100	100	94
		15	47	100	100	100	100	100	0	98	0
		151	6	100	100	0	0	0	50	67	100
7	Michigan	11-32	1	100	100	0	100	0	100	100	100
		15	5	100	100	100	100	100	0	80	0
		151	15	100	100	0	0	0	0	100	100
4	Minnesota	11-32	1	100	100	0	100	0	100	100	100
		15	9	100	100	100	100	100	0	100	0
2	Missouri	151	6	100	100	0	0	0	0	100	100
45	Nebraska	11-32	18	100	100	0	100	33	100	100	100
		15	79	100	100	100	100	100	0	95	0
		151	29	100	100	0	0	28	34	100	100
4	North Carolina	11-32	2	100	100	0	100	0	100	100	100
		151	10	100	100	0	0	0	30	100	100
25	Oklahoma	11-32	7	100	100	0	100	43	100	100	100
		15	25	100	100	100	100	100	0	96	0
		151	21	100	100	0	0	0	0	100	100
3	S. Carolina	15	3	100	100	100	100	100	0	100	0
		151	6	100	100	0	0	0	0	100	100
8	S. Dakota	11-32	3	100	100	0	100	0	100	100	100
		15	13	100	100	100	100	100	0	23	0
		151	2	100	100	0	0	0	0	50	100
84	Texas	11-32	68	100	100	0	100	31	98	88	100
		15	69	100	100	100	100	100	0	83	4
		17	1	0	100	0	100	0	0	100	0
		151	88	100	100	0	0	43	74	100	100
7	Virginia	11-32	2	100	100	0	100	0	0	100	0
		151	18	100	100	0	0	6	6	100	100
14	W. Virginia	11-32	4	100	100	0	100	0	100	100	100
		151	34	100	100	0	0	0	0	91	100